Environmental Protection

Newtown Creek
CWA/CERCLA Coordination

Loading of CERCLA Hazardous Substances

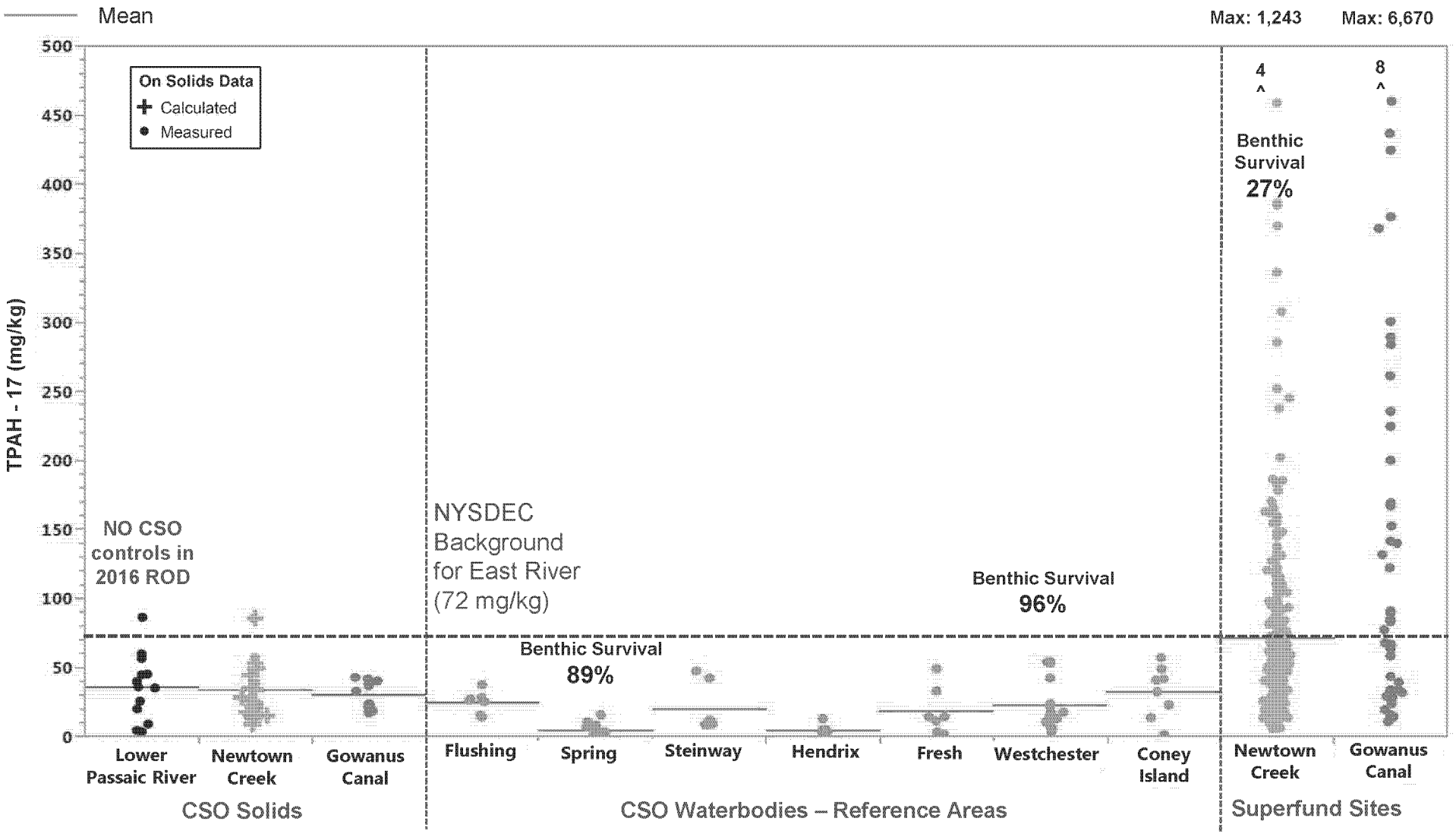
August 15, 2017

Agenda

1. Comparison of Point Source Solids to Background Levels
2. Point Source Contaminant Loads
   - Waste Water Treatment Plant (WWTP) Treated Effluent
   - Combined Sewer Overflow (CSO) – Pre- and Post-LTCP
   - Municipal Separate Stormwater Sewer System (MS4)
   - Private /Other Stormwater / Direct Drainage
   - Private Treated Effluent / Permitted Discharge
3. Assessment of Point Source Impacts on Surface Sediments
4. Overview of the LTCP Path Forward

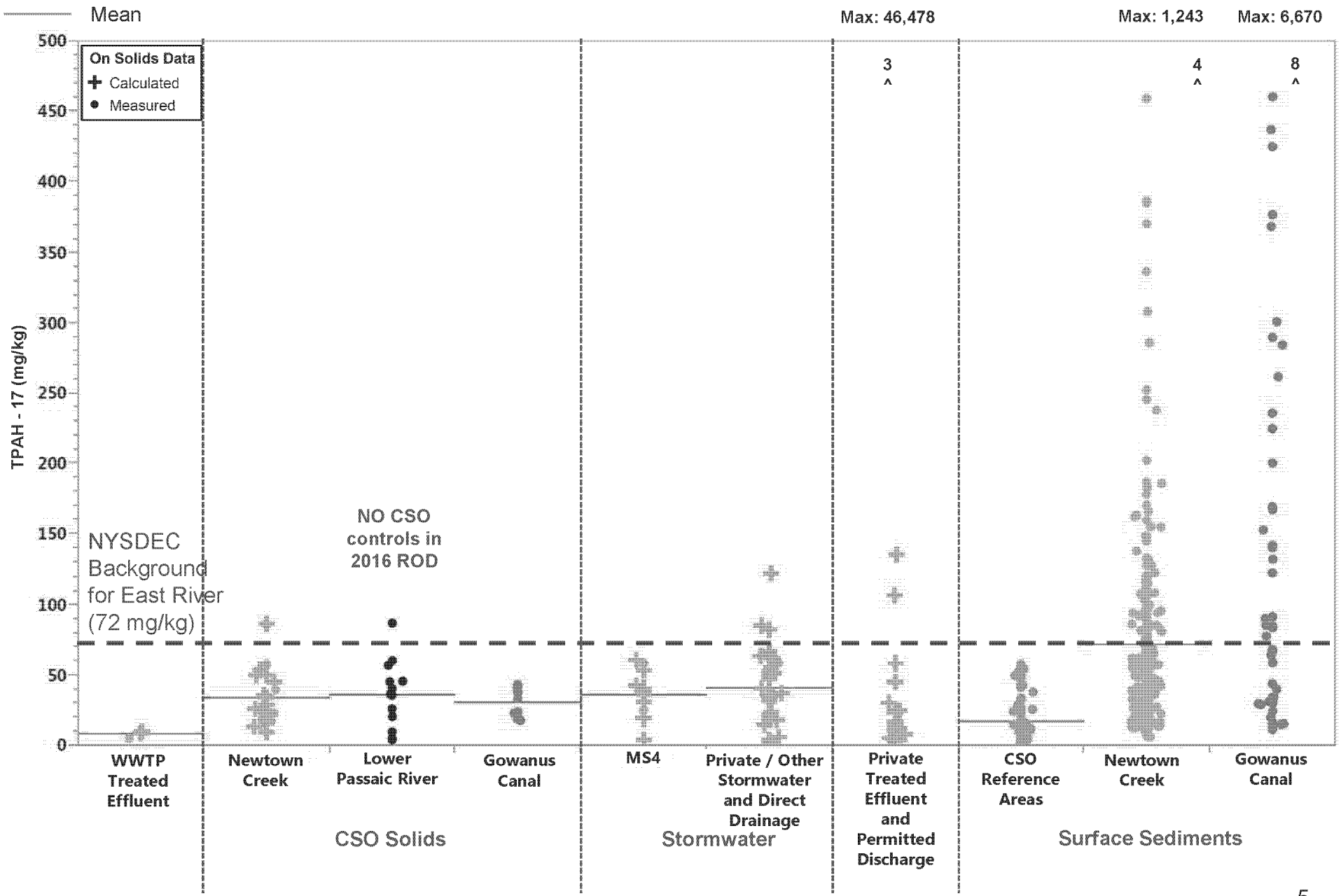
1. Comparison of Contaminant Concentrations from Point Source Solids to Background

CSO TPAH(17) levels similar to Reference Areas

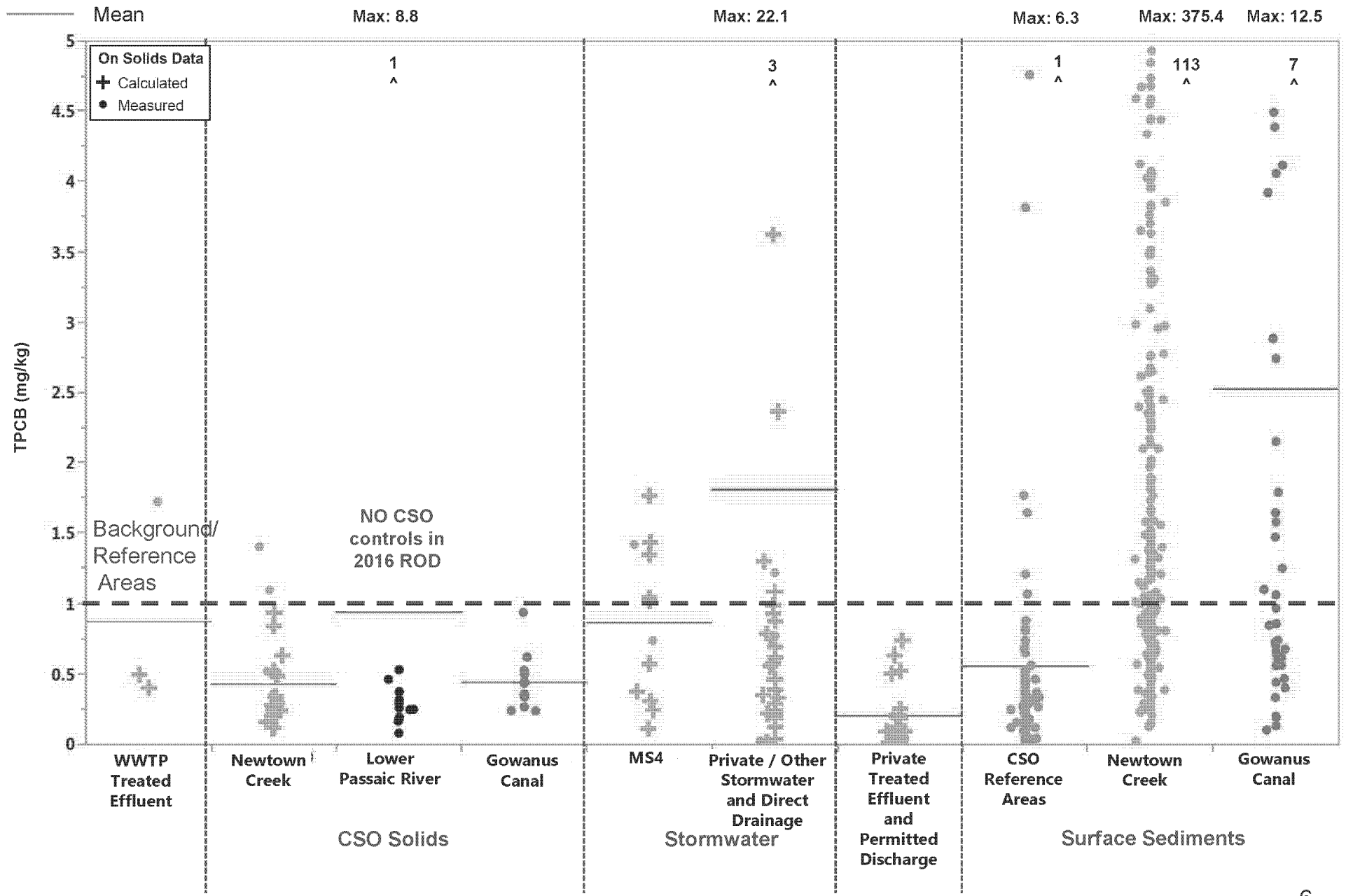


TPAH levels in non-Superfund CSO waterbodies are similar to CSO solids
These waterbodies have similar sewersheds, histories and CSO levels.
CSO contributions are not the cause of elevated concentrations.

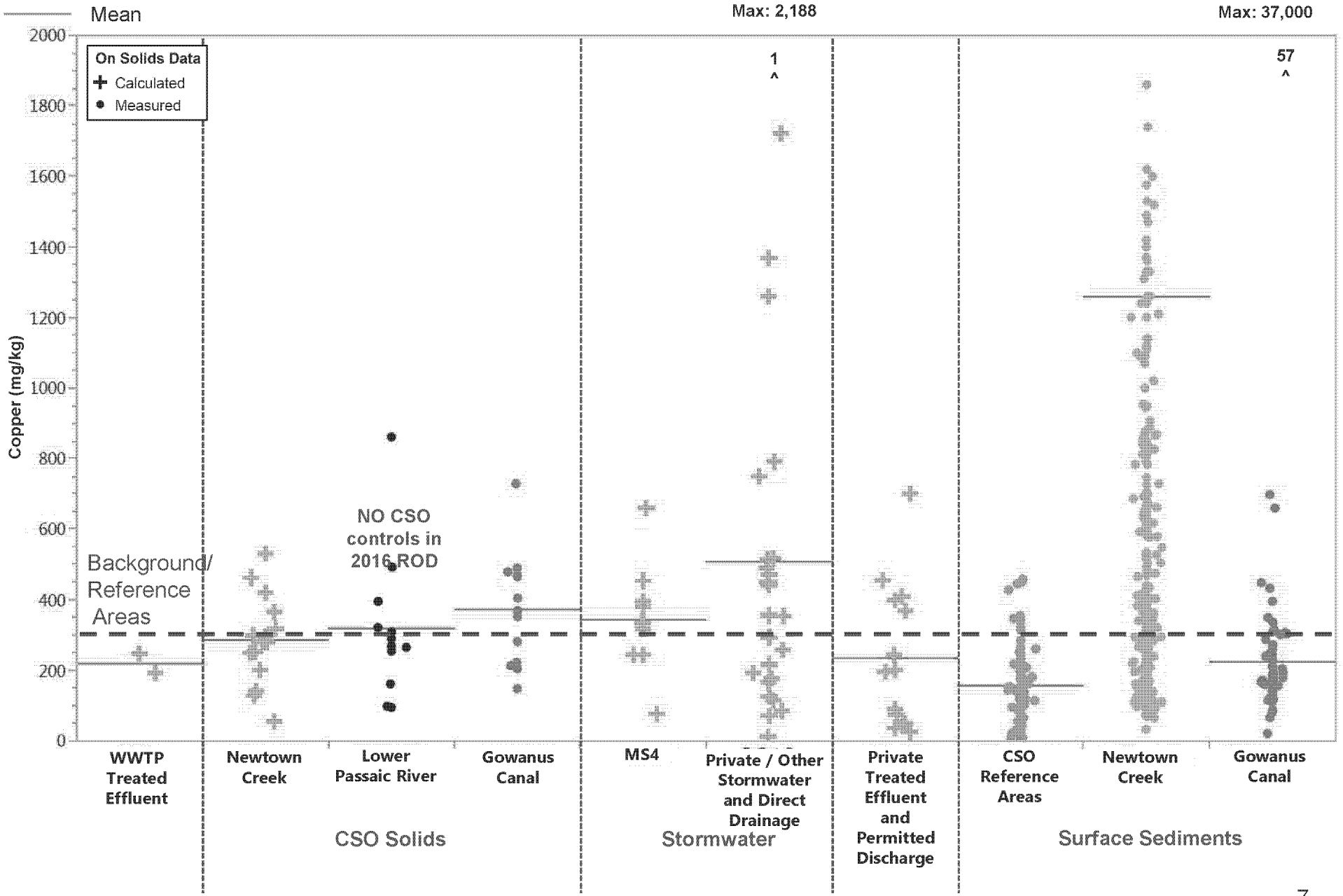
Relative Point Source TPAH(17) Concentrations



Relative Point Source TPCB Concentrations



Relative Point Source Copper Concentrations

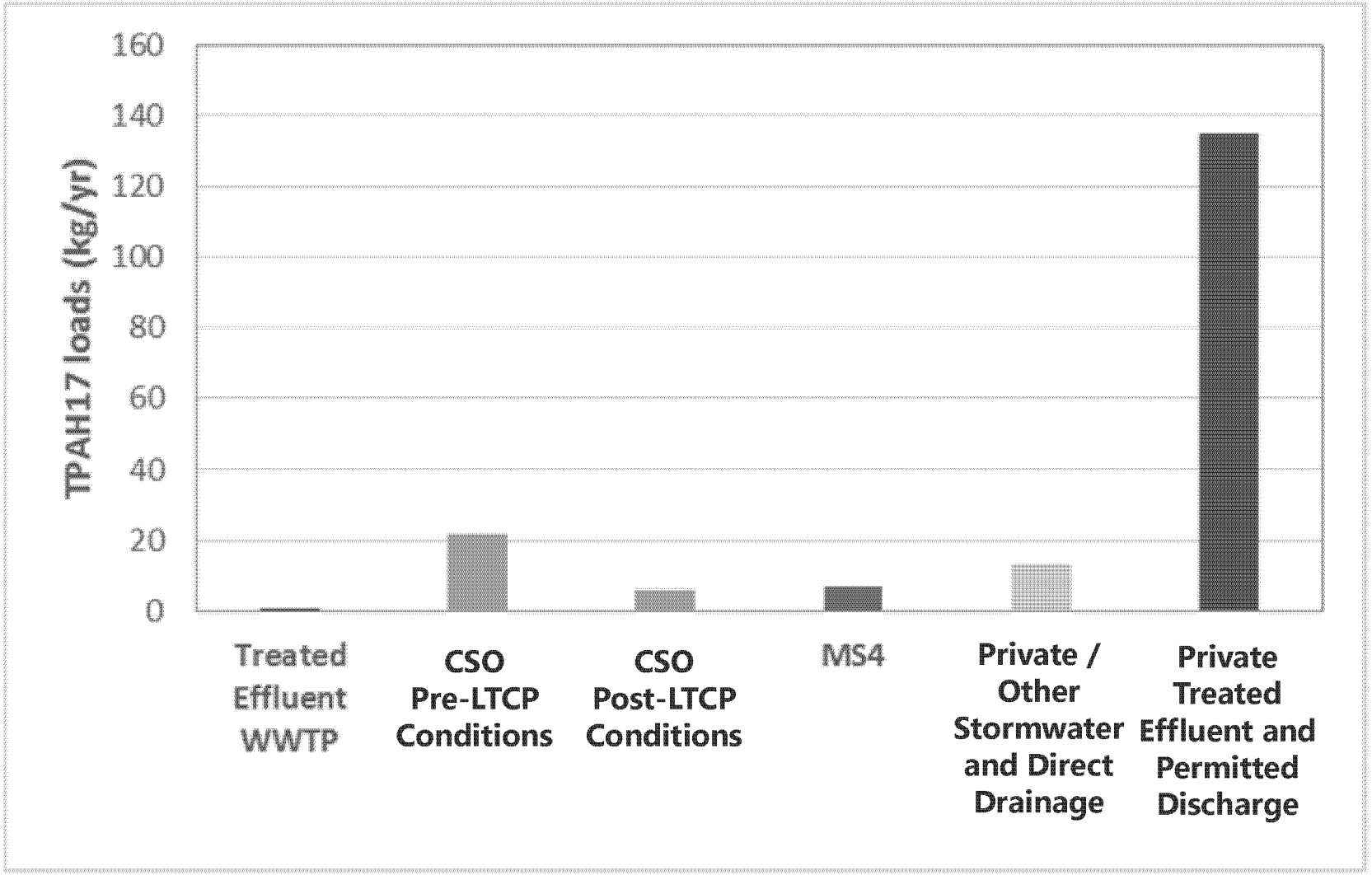


2. Contaminant Loads from Point Sources

Contaminant Loads for Point Sources

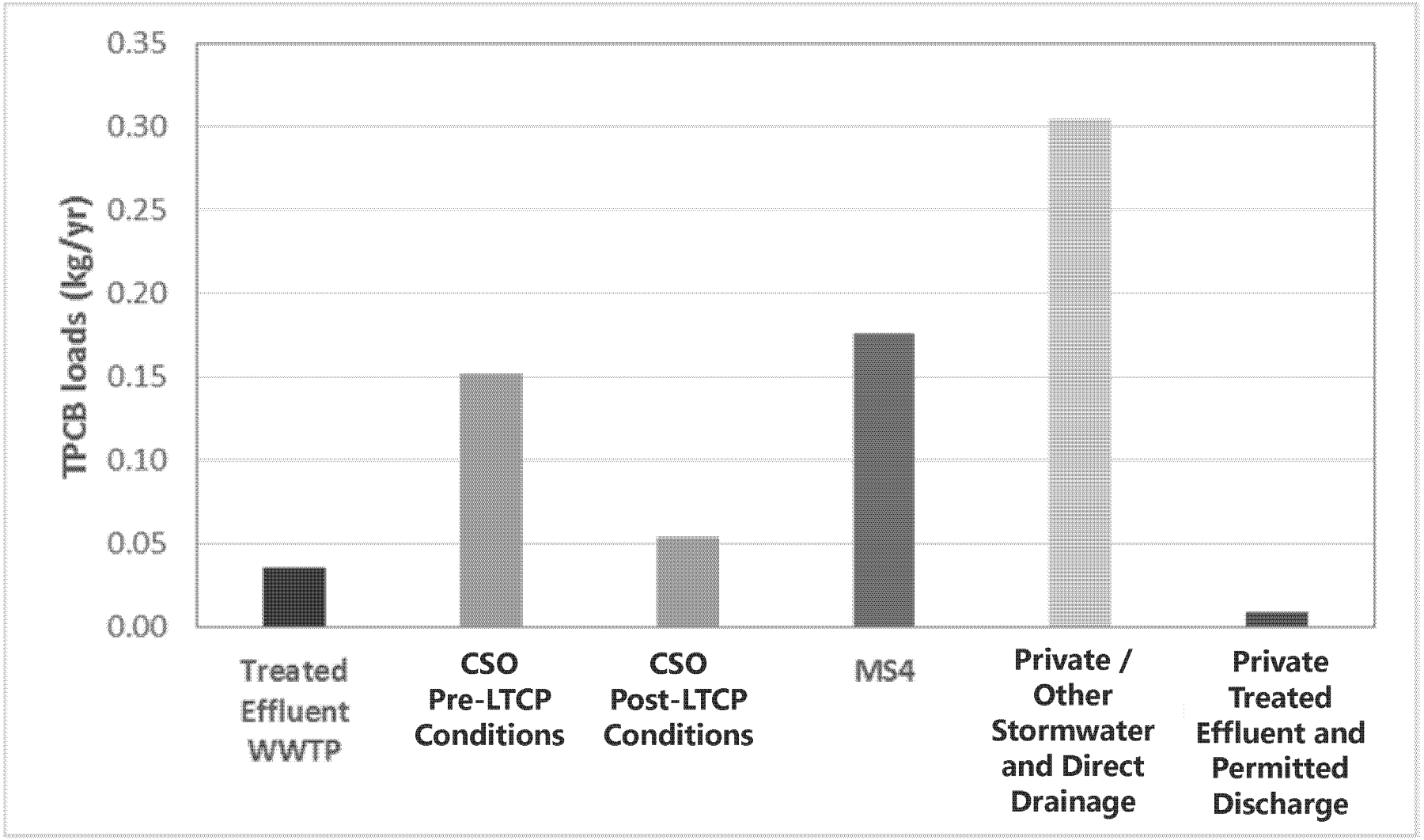
- Loads based on Infoworks pre- and post-LTCP flows
  - WWTP Treated Effluent (~500 MGY)
  - Pre-WBWS FP CSO Flows (~1600 MGY)
  - Post-LTCP CSO Flows (~450 MGY)
  - Private /Other Stormwater / Direct Drainage (~530 MGY)
  - MS4 (~400 MGY)
  - Private Treated Effluent / Permitted Discharge (~250 MGY)
- 2008 rainfall data was used to estimate current and future conditions of stormwater and CSO
- AQ/NCG RI/FS estimates used for Private Treated Effluent / Permitted Discharge volumes
- AQ/NCG RI/FS whole water contaminant data used for concentrations
- Loads calculated with outfall specific data (flow and concentration)
- NYC data supports EPA data, provides statistical rigor

Point Source Loads: TPAH 17 (kg/yr)



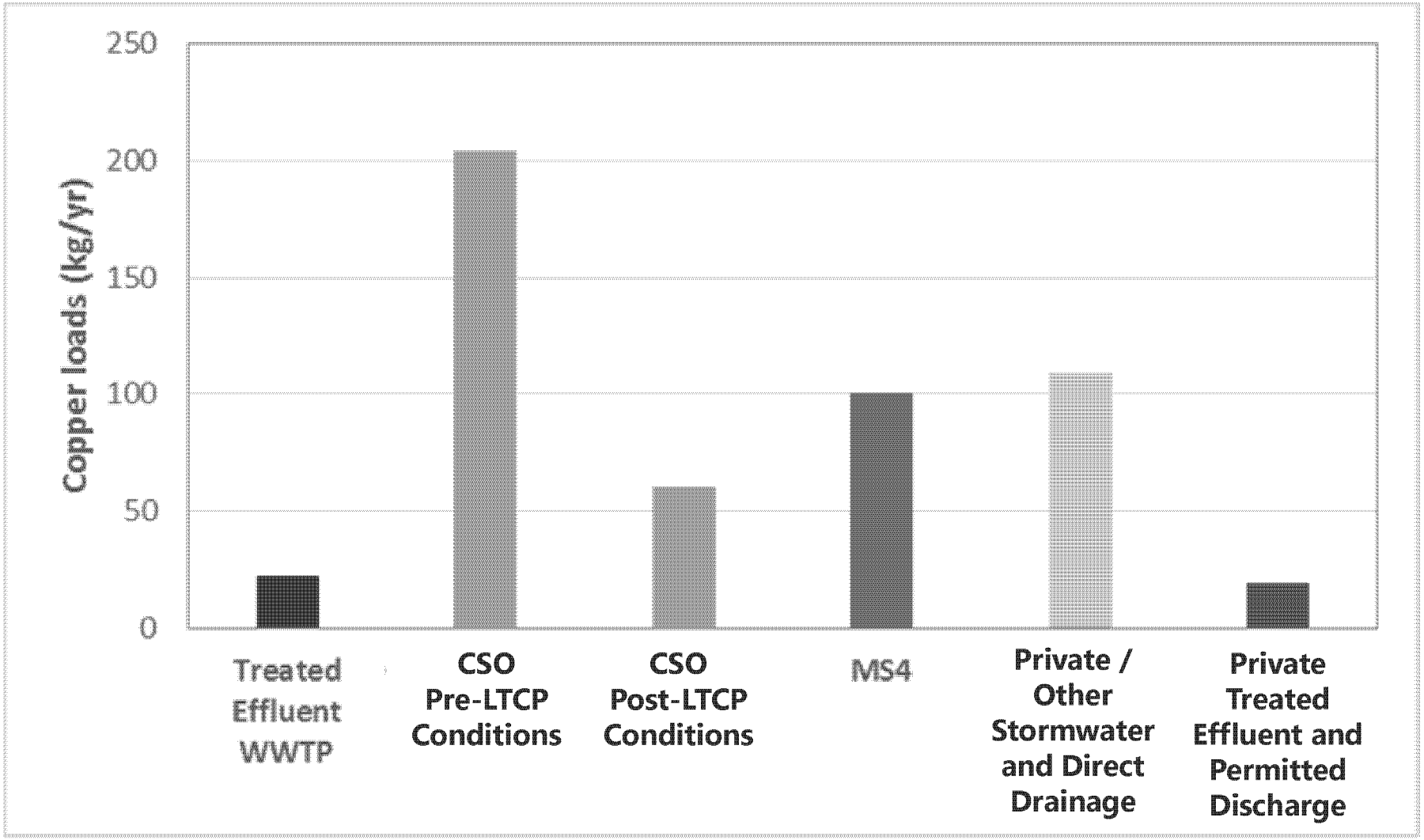
TPAH loads are driven by specific discharges with relatively low flows

Point Source Loads: TPCB (mg/kg)



Stormwater from private sites is the greatest point source PCB load - there are many, many pipes/sites that discharge stormwater to NC

Point Source Loads: Copper (mg/kg)



CSO flows are a mix of sanitary/stormwater (typically mostly stormwater) – contain background levels of CERCLA hazardous chemicals

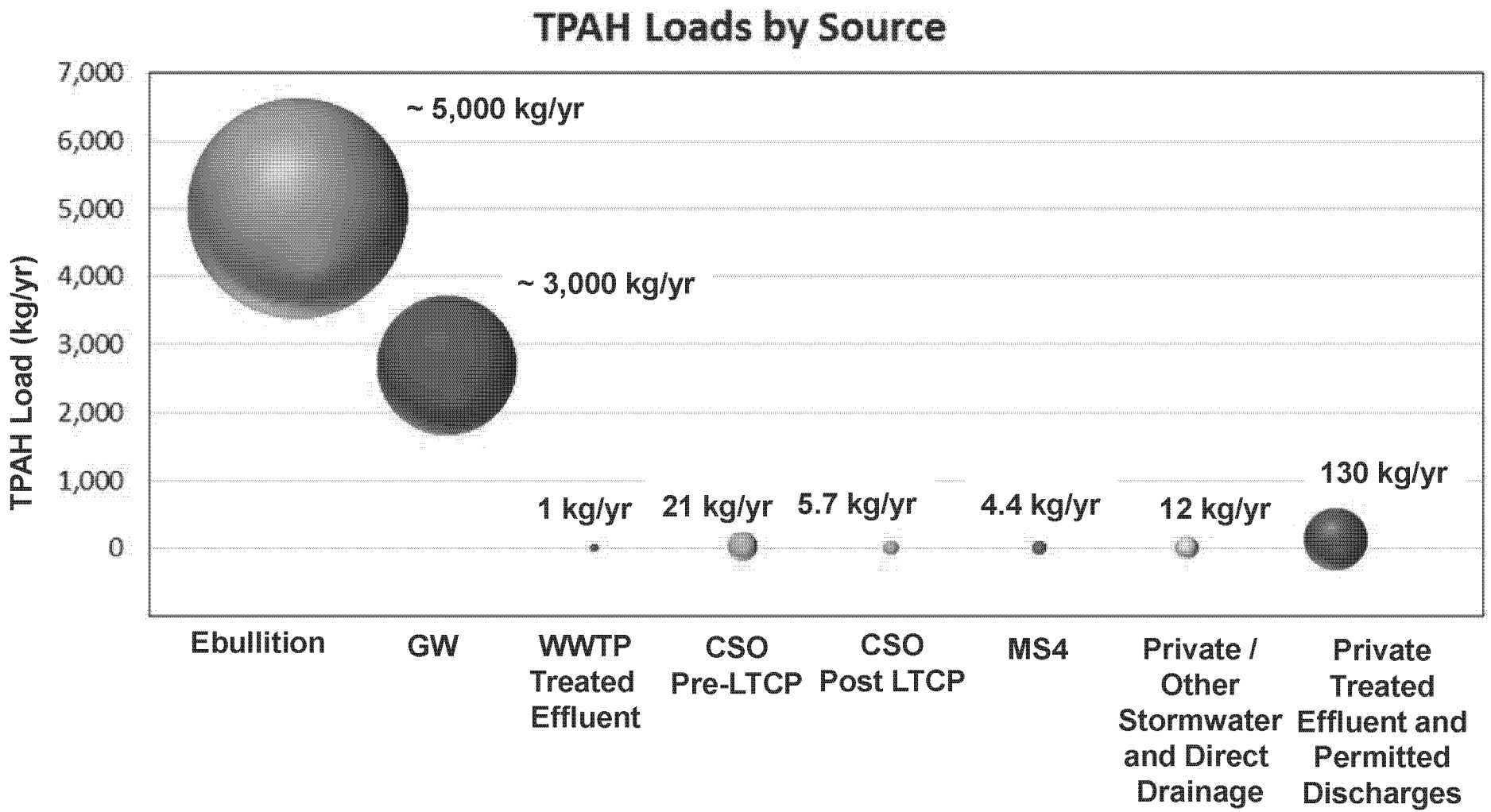
Summary of Point Source Loads (kg/yr)

	WWTP Effluent	CSO		MS4	Private / Other Stormwater and Direct Drainage	Private Treated Effluent and Permitted Discharges
		Pre-LTCP	Post-LTCP			
Flow (MGY)	500	1,600	450	400	530	250
# of pipes	1	21	21	11	Hundreds	10
Analyte Group						
TPAH – 17 (kg/yr)	1	21	5.7	4.4	12	130
TPCB (kg/yr)	0.035	0.15	0.05	0.09	0.35	0.15
Copper (kg/yr)	25	204	61	100	105	25

Unique intermittent discharges that may be outliers can bias loads.

CSO/stormwater is typical urban background and not a toxicity driver.

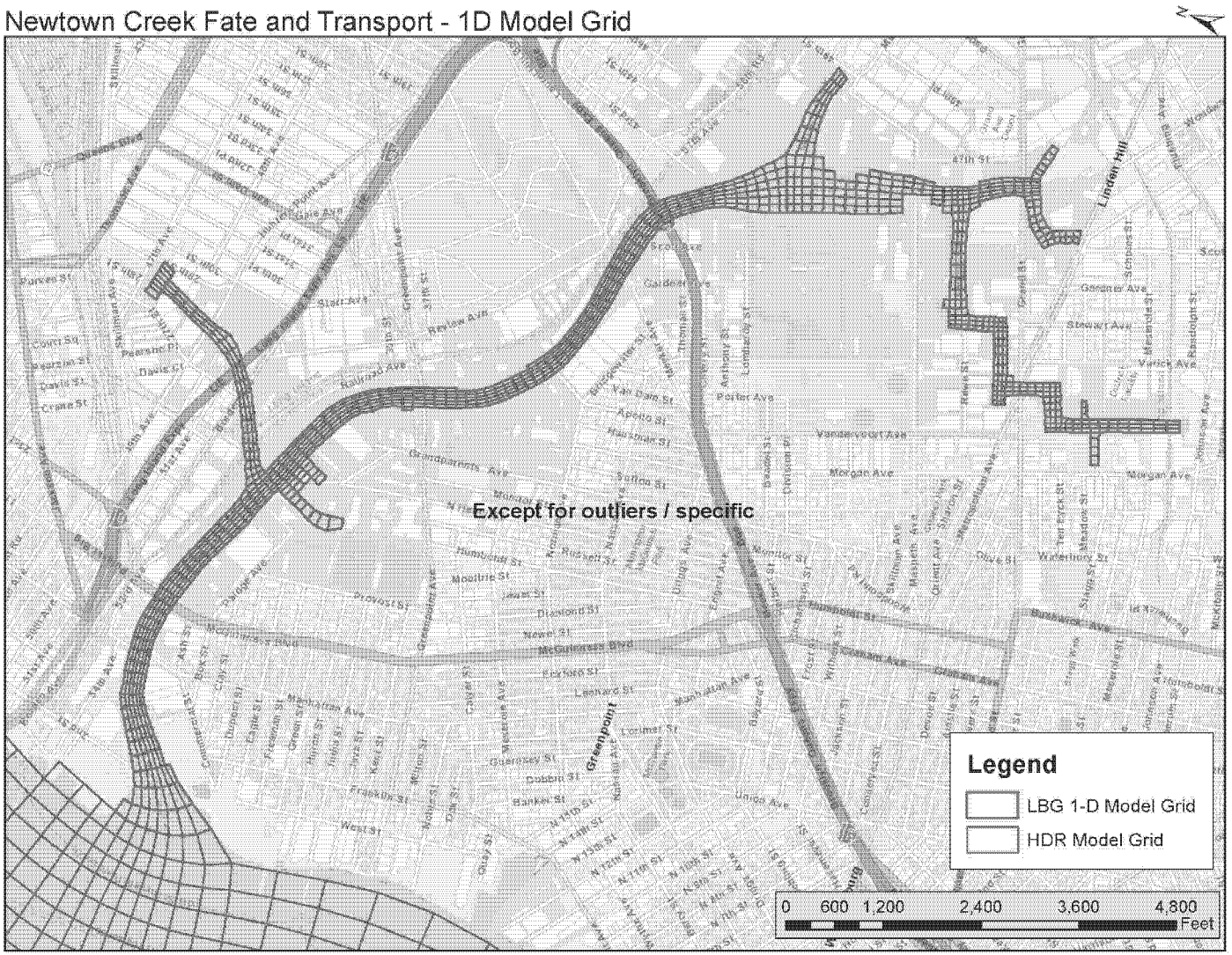
Loads by Categories



Flow/concentration input does not "move the needle"- point sources are not the impact drivers.

3. Assessment of Point Sources Impacts on the Surface Sediments of Newtown Creek

Model Segmentation

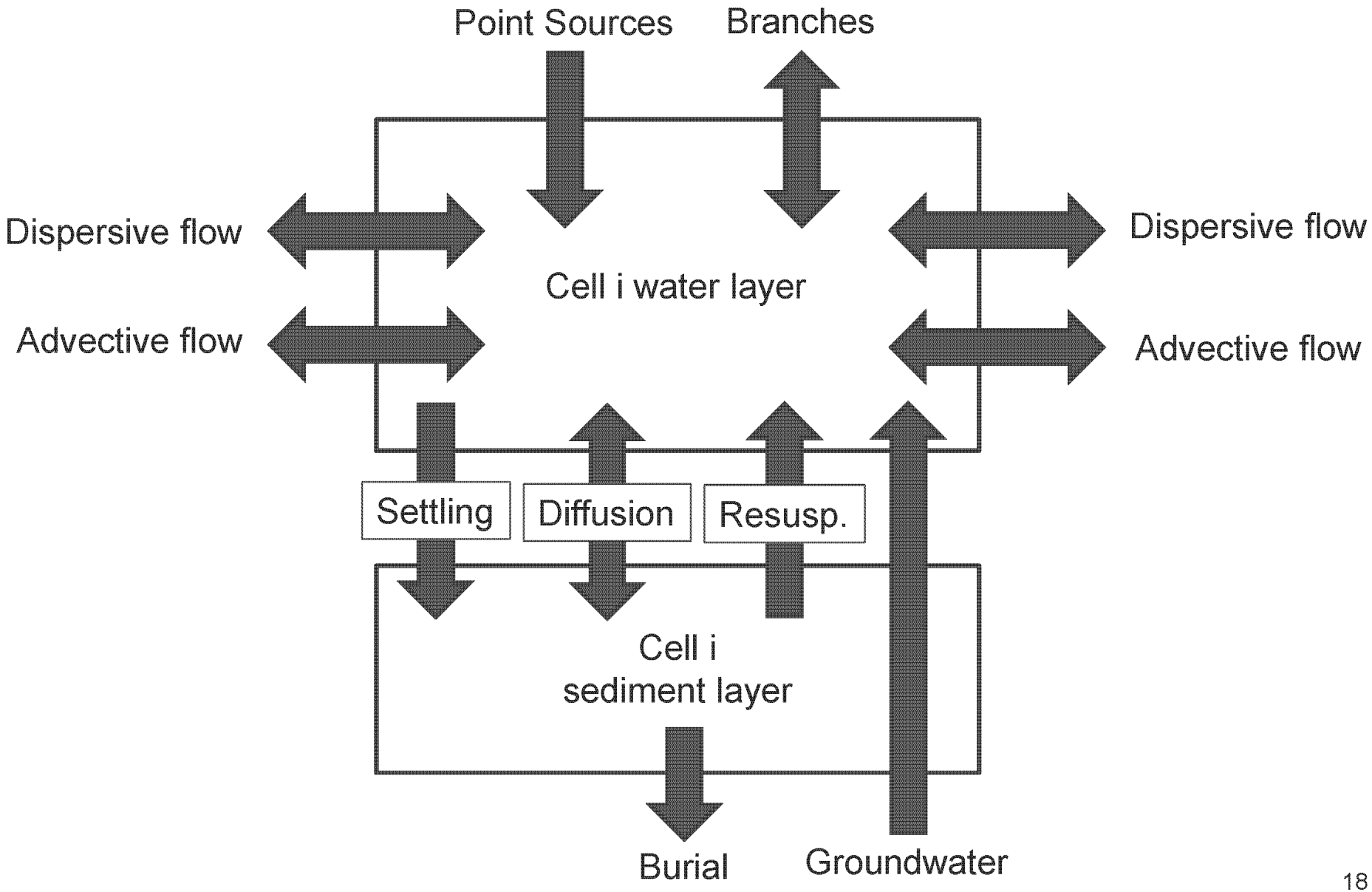


Loads are one input into models to assess remedy selection

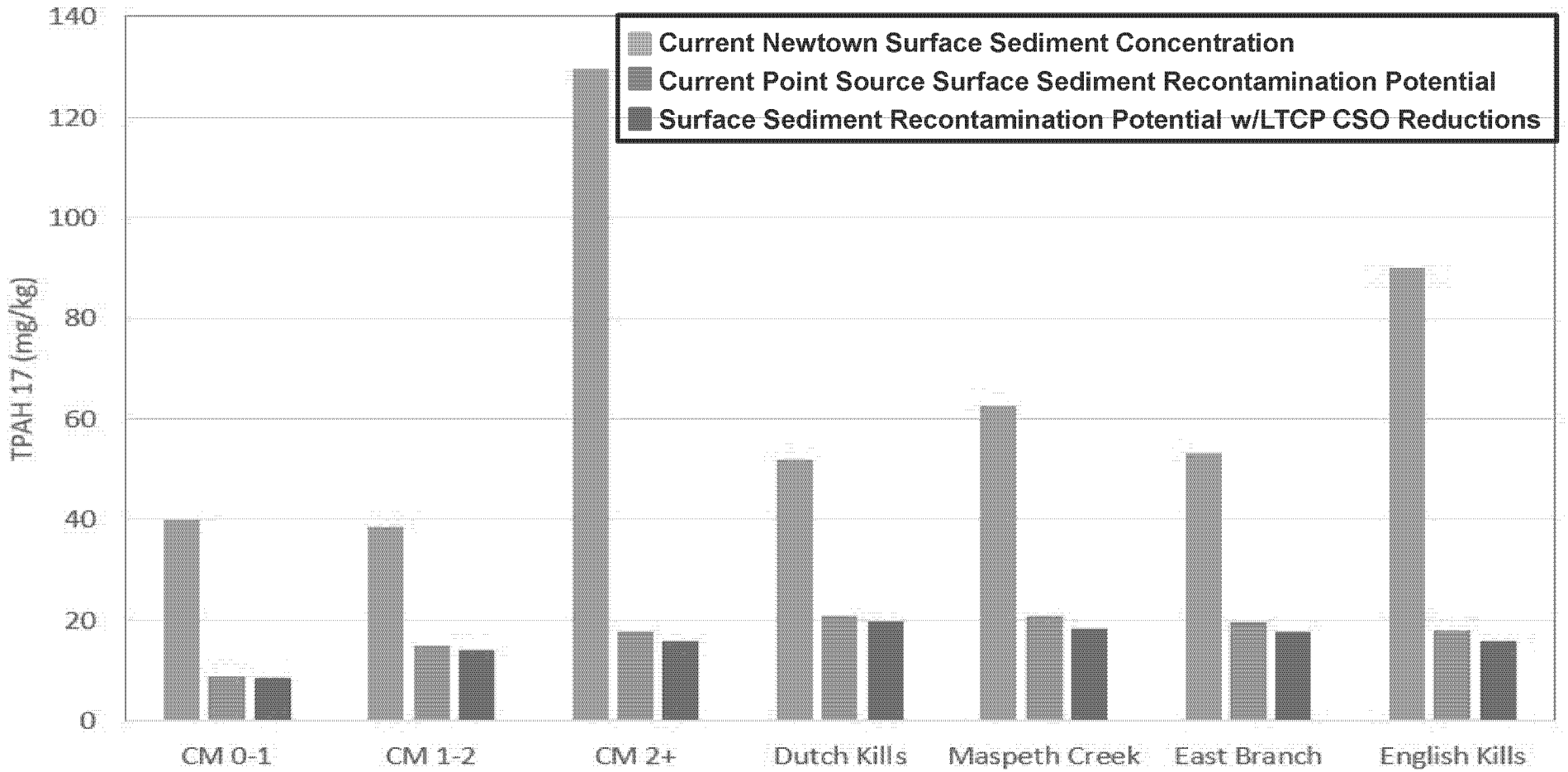
Chemical Fate Model Formulations

- Hydrodynamic and Sediment Transport Output from LTCP Model
- Chemical Fate Model Based on Contaminant Mass Balance
- Water Column Algorithm - ULTIMATE QUICKEST
  - ULTIMATE – Universal Limiter for Transient Interpolative Modeling of Advective Transport Equation (Leonard 1991).
  - QUICKEST – Quadratic Upstream Interpolation for Convective Kinematics with Estimated Upstream Terms (Leonard 1979).
  - Consistent with USACE formulation for CEQUAL-ICM and Lake Michigan Mass Balance Model
- Sediment Bed – Chemical Contaminant
  - A single Mixed Layer modeled with Runge Kutta 4th Order Algorithm
  - 2008 w/GW load and weighted point source concentration at each cell

Mass Balance

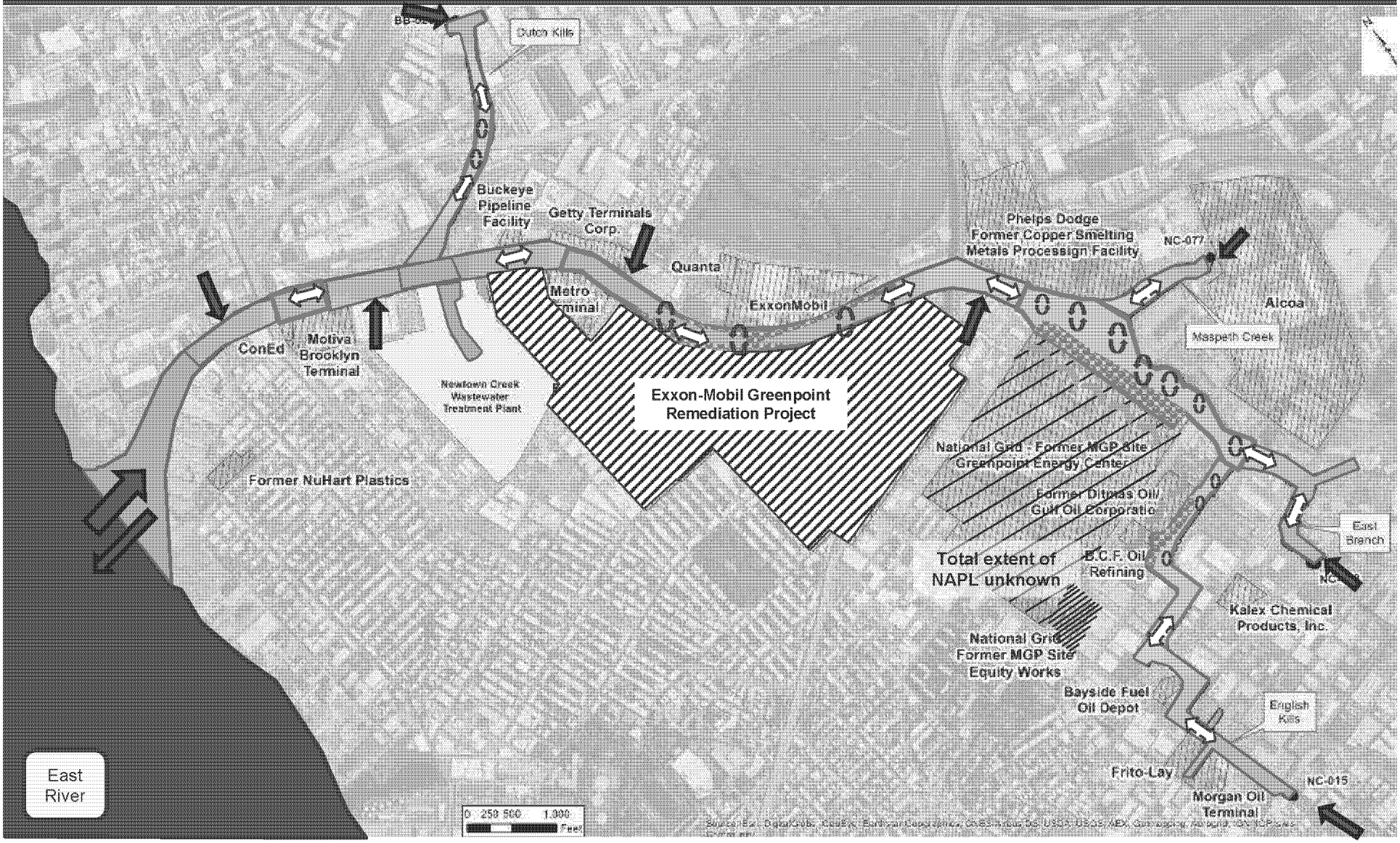


Point Source Recontamination Potential



- Model assumes all other sources controlled (upland sites, groundwater, seeps etc.)
- Recontamination potential assessed by assuming "Clean Cap" to evaluate impacts
- Simulation includes all point sources run for 30 years

Newtown Creek – Conceptual Site Model



Solids Loads – East River, CSO, stormwater and direct drainage at regional background concentrations

Upland areas with subsurface NAPL

Areas of elevated sediment concentrations and likely ongoing NAPL source areas

Likely ongoing NAPL and contaminated GW transport

Areas with NAPL migration from upland bulkheads and ebullition

Resuspension and mixing of contaminated sediments

Tidal transport

4. Overview of LTCP Path Forward

Path Forward

The data show that CSO discharges are not a significant source of hazardous substances in Newtown Creek. Nevertheless, the City expects the CSO control alternative selected in this LTCP (see Section 8) would be sufficient to address any CSO discharge controls that EPA may require under Superfund.

The City concurs with comments from DEC, dated March 16, 2017, and from EPA, dated May 9, 2017, in which each stated that "[b]iological data from reference areas with CSO point source discharges indicate risk from CERCLA [chemicals of potential concern (COPCs)] as evaluated from these data could be significantly decreased to background (reference area) levels even with continuing CSO discharge during storm events." (EPA Comments at ES-3, Specific Comment 9; DEC Comments at 4, Specific Comment 1.g).

-NYCDEP 2017 Newtown Creek Long Term Control Plan

- **CSO and MS4 solids are at or below the background concentrations**
  - **CSO reference areas at background concentrations do not show toxicity**
  - **Multiple lines of evidence that CSO solids do not require CERCLA controls**
  - **NYC $1.3B LTCP project will significantly reduce CSO**

Questions?